

The Wild Hog Problem in Michigan

Summary

Michigan has seen an explosion of wild hogs, also known as feral swine, with an estimated 5,000 feral swine roaming wild in about 70 of Michigan's 83 counties in both the Upper and Lower peninsulas. Feral swine are wild pigs that are omnivorous, eating plants and animals. They carry numerous diseases, are highly destructive to farms and property, travel in packs, and can endanger people. Feral swine are not domesticated pigs on farms, but descendants of imported wild pigs. USDA experts say Michigan's feral swine problems stem from escaped Eurasian hogs imported into Michigan from other states and countries for small hunting clubs.

Background

Michigan's commercial agriculture community has been alarmed by the escalating numbers of feral swine identified in Michigan and the threat these animals pose to commercial agriculture, especially the domestic pork industry. To date, feral swine have been killed or sighted in 69 counties in Michigan and reports of significant crop damage have also escalated in recent years. In fact, it has been estimated by USDA that wild hogs are responsible for more than \$1.6 billion in crop damage annually nationwide.

Animals that have escaped from the sport shooting facilities have been a factor in increasing the feral swine population and these animals are excellent vectors for transmitting diseases. Research studies (Hutton et al, 2006) confirm that feral swine can carry as many as 30 viral and bacterial diseases, including tuberculosis, and at least 37 parasites that affect people, livestock, wildlife and pets. In fact, in recent years, some animals from these facilities in Michigan have been found to be infected with the pseudorabies virus.

Although humans are not susceptible to this virus, it is a devastating disease to swine and also to some other species of livestock. In 2000, Michigan was successful in eradicating pseudorabies from its commercial swine herds and in 2004 the disease was eradicated from all of the commercial swine herds in the United States.

Prior to being eradicated nationwide, pseudorabies was an economically devastating disease that was estimated to cost U.S. producers more than \$30 million dollars annually in death losses, impaired performance and vaccination costs. The re-appearance of this disease in commercial

swine herds in Michigan could cost the state its *pseudorabies-free* status which would lead to other states closing their borders to Michigan's commercial swine industry.

Many of Michigan's commercial producers have contractual arrangements with producers in surrounding states to feed hogs to marketable weights and, if they were no longer allowed to send animals to these states, the economic consequences would be significant. In fact, it is likely that these animals would have to be euthanized since housing space for them would not be available in Michigan. Recent estimates indicate that between 20,000 and 30,000 hogs weekly are being transported from Michigan to be raised for market in surrounding states.

In addition to commercial agriculture, wild hogs imperil wildlife, destroy natural resources and the environment and pose a major threat to human health and safety. Recognizing these concerns and realizing that wild hogs meet the criteria of an invasive species under Public Act 451, the Natural Resources and Environmental Protection Act, former Department of Natural Resources and Environment Director Rebecca Humphries signed an order on December 9, 2010, declaring wild hogs an invasive species. The order is scheduled to take effect on July 8, 2011, and the delay was reasonable in that it gives the shooting facilities adequate time to sell and dispose of the animals in their inventories.

The Michigan Pork Producers Association (MPPA) and a number of other agriculture, wildlife and conservation organizations are concerned that the delay will also allow efforts to be pursued to pass legislation to regulate the sport shooting industry. These groups have recently come together to form the *Coalition to Preserve Michigan Agriculture and Natural Resources*. Coalition members believe a regulatory approach to addressing the problems wild hogs pose is ill-advised and would be counterproductive.

The Michigan Department of Natural Resources estimates that appropriate regulation of the sport shooting industry would cost in excess of \$750,000 annually. However, the sport-shooting facility owners have vigorously opposed containment and other management requirements that would be necessary if the industry were to be adequately regulated to prevent these animals from escaping and proliferating in the wild as they have for the past decade.

Because of the risk wild hogs pose to all segments of agriculture, as well as to the environment, wildlife and humans, the *Coalition to Preserve Michigan Agriculture and Natural Resources* is united in opposing regulation of the swine sport shooting industry. The Coalition is working collectively to convey to legislators and the public that a regulatory approach will be costly and ineffectual, and that the order declaring wild hogs an invasive species should be allowed to take effect on July 8, 2011, making it illegal to possess these animals for sport shooting purposes.

The Coalition to Preserve Michigan Agriculture and Natural Resources

The Coalition to protect Michigan Agriculture and Natural Resources (CPMANR) is a coalition of agricultural, conservation and natural resources organizations concerned about the growing threat to Michigan's natural and agricultural resources posed by feral swine. Feral swine are free-ranging populations of wild pigs that are carriers of numerous diseases which can infect livestock, wildlife and humans. These animals are also destructive to agriculture, natural resources and private property. The USDA has estimated the damage caused by these invasive animals at more than \$1.5 billion nationally.

The Coalition members below strongly support the Invasive Species Order Amendment No. 1 of 2010 issued by the Director of the Michigan Department of Natural Resources in December 2010 which classifies the destructive animals an invasive species effective July 8, 2011.

Coalition Members:

GreenStone Farm Credit Services
Michigan Agri-Business Association
MI Allied Poultry Industries, Inc.
Michigan Audubon
Michigan Corn Growers Association
Michigan Milk Producers Association
Michigan Nature Association
Michigan Pork Producers Association
Michigan Soybean Association
Michigan United Conservation Clubs
Michigan Wildlife Conservancy
Potato Growers of Michigan, Inc.
Saginaw Field & Stream Club
Wine Producers of Michigan

Other Organizations Opposed to the Bills:

Chelsea Rod & Gun Club
Michigan Environmental Council
MI State Council of Pheasants Forever
Michigan Trout Unlimited
The Nature Conservancy
Northern Macomb Sportsmen Alliance

Key Points Regarding the Wild Hog Problem

- Wild hogs pose a huge threat to the health and welfare of the domestic pork industry and are known vectors of diseases such as pseudorabies, brucellosis, bovine tuberculosis, trichinosis and numerous other bacterial and viral diseases that, if transmitted to domestic swine, could restrict movement and impede commerce resulting in huge losses to domestic pork producers and other industries dependent on pork production such as feed suppliers, meat processors, transporters, etc.
- Wild hogs are aggressive, destructive and nearly impossible to contain behind fences.
- Wild hogs destroy crops and are estimated by USDA to be responsible for \$1.6 billion in crop damage annually.
- Wild hogs endanger humans, imperil wildlife populations and impact the environment by disrupting ecosystems.
- Regulating wild hogs for sport shooting purposes is akin to regulating Asian Carp for sport fishing.
- Regulating wild hogs would be extremely costly and likely would be ineffectual in preventing them from continuing to escape and proliferate in the wild.
- The Invasive Species Order issued by the Department of Natural Resources bans all recreational shooting of swine behind fences and should be allowed to become effective as proposed on July 8, 2011.
- An effective eradication program should be established to eliminate, by trapping and other appropriate methods of removal, those hogs already in the wild. An ongoing surveillance and testing program should accompany the eradication effort in order to determine the disease status of hogs roaming free in the wild.

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Coalition to Protect Michigan Agriculture and Natural Resources

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The Nature Conservancy
Northern Macomb Sportsmen Alliance

*This is either through cards or letters submitted to the Clerk of the House Agriculture Committee.

THE HISTORY OF THE CITY OF BOSTON

FROM THE FIRST SETTLEMENT
TO THE PRESENT TIME
BY
JOSEPH NEALE, ESQ.
OF BOSTON.

LONDON:
PRINTED BY J. JOHNSON, ST. PAULS CHURCH-YARD, 173.

IN TWO VOLUMES.
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Muskegon Chronicle

Letters: Feral pigs are an invasive species

Thursday, June 02, 2011, 7:54 AM



COURTESY PHOTO

This feral pig, which appears to be feeding on a deer carcass, was photographed in a field north of Muskegon. Our letter writer wants a ban of feral pigs in Michigan.

West Michigan, including the Muskegon area, has the potential to be a major center for food processing. The area is already home to large dairy and poultry operations that employ many people. Key commodities and specialty crops, such as fruit and vegetables, are also important contributors to the local economy.

Unfortunately, these economic opportunities and jobs could be at risk by allowing hunt clubs to continue to import feral swine into Michigan. They are an invasive species and known to carry diseases that could be devastating to the livestock industries in our state. These dangerous animals put agriculture, property, our natural resources and jobs at risk.

I urge our West Michigan senators and representatives to ban feral swine, period.

Robert Kran

Freesoil

April 10, 2011

Commentary: Open no gates for feral swine

BY GEORGE HOUSE
DETROIT FREE PRESS GUEST WRITER

There's a joke about feral swine in Texas, a state overrun by more than 3 million of the highly destructive, fast-breeding creatures.

The joke goes something like this: If a feral sow has a litter of six, eight will survive.

In Michigan, as in Texas, feral swine are no laughing matter for family businesses in agriculture, landowners and tens of thousands of people whose livelihoods are at risk because of the invasive species. Feral swine threaten jobs in this state -- and without a permanent ban on them now, the out-of-control plague in Texas will soon become Michigan's scourge, too.

Descended from nonnative species such as Russian and Eurasian boars and razorbacks that escaped their enclosures in Michigan, more than 5,000 feral swine run wild here, according to wildlife experts' estimates.

Before a few hunt clubs began importing the nonnative species into Michigan, it was a problem we associated only with places like Texas and the South. Now, herds of feral swine -- each averaging around 300 pounds -- wreak havoc by destroying land and damaging important crops and plants.

Voracious omnivores, feral swine will eat everything: wheat and corn in the fields, wine grapes on the vine, fruit on branches, even chicken eggs in poultry farms and very young animals.

In addition to causing immediate damage to crops and property, these fearsome creatures are vectors of diseases that can destroy Michigan's livestock sector. Bovine tuberculosis and pseudorabies endanger thousands of family businesses in the dairy and pork industries, which together employ more than 32,000 people statewide.

Taxpayers will also get stuck with some of the bill.

According to a nonpartisan Michigan House Fiscal Agency analysis, regulating deer and elk hunting facilities -- commonly linked to game swine operations -- cost more than \$1.3 million in taxpayer dollars in 2009. In 2008, imported game swine in several northern counties had to be destroyed because of disease -- and taxpayers footed the \$415,000 bill.

That's why groups from agriculture to sportsmen to conservationists are calling on Michigan's Legislature to uphold and let stand a state order banning feral swine as an invasive species, as eight states already do. Legislators should reject proposals that will open the door to more feral swine by giving a small number of hunt clubs a free pass.

Ted Nugent, who owns a hunting preserve near Jackson, has downplayed the threat of feral swine and recently met with Gov. Rick Snyder to discuss his views on Michigan's game regulations. But Nugent apparently doesn't know the heavy damage feral swine inflict on agriculture and jobs.

In fact, in his home state of Texas, feral swine cause more than \$400 million in damages every year. Texas Farm Bureau spokesman Gene Hall told the Associated Press on March 18: "They can do more damage than a bulldozer."

Michigan must close its doors to feral swine. The science and evidence are overwhelmingly clear: The best way to stop an invasive species like feral swine is to ban them, period.

George House is executive director of Michigan Allied Poultry Industries Inc. He writes on behalf of Agricultural Leaders for Michigan, a group that also includes representatives of the state's milk producers, potato growers and pork producers.

Viewpoint: Ban is the best way to fight feral swine threat

Friday, May 20, 2011, 4:36 PM

By Dennis De Young

West Michigan's media are shining a timely light on the feral swine epidemic.

An invasive species, feral swine are a serious threat to Michigan agriculture, our economy and thousands of local jobs.

Feral swine have been known to tip the scale at 400 pounds each. They are fast, destructive, fearless, prolific breeders, highly intelligent and voracious omnivores that will eat anything in sight: corn in the fields, fruit ripening on branches and chicken eggs on poultry farms.

Wildlife experts estimate there are more than 5,000 of these invasive species roaming wild in Michigan. Descended from non-native species such as Eurasian boars and razorbacks that were imported to boutique Michigan hunt clubs and then escaped, these invasive species are vectors for contagious diseases that can devastate livestock and harm human health.

Last year, Michigan took the right steps to deal with the feral swine problem, by issuing an order that bans feral swine and declares them an invasive species.

This is the only sensible way to deal with any invasive species. We wouldn't try to control Asian carp with regulations — they simply need to be kept out of Michigan waters. In the same way feral pigs need to be kept out of our state.

Unfortunately, politicians in Lansing now want to undo this ban, threatening to open the door to more feral swine and worsen the epidemic.

Their proposals will send Michigan backwards in the fight against feral swine. The controversial elements of their plan include:

- Giving a virtual free taxpayer-subsidized pass to importers who bring exotic non-native hogs and razorbacks into Michigan.
- Re-categorize this invasive species as an "agriculture" product.
- Exempting hunt clubs with invasive species from inspections by state regulators.
- Charging either no or minimal fees for importing the invasive species. The proposed fees will generate only an estimated \$33,000 annually from the roughly 65 hunt clubs in Michigan, even as

regulating captive species at hunt clubs costs more than \$1 million in taxpayer funds every year, according to independent analysis by the House Fiscal Agency.

- Requiring taxpayers to pay for additional costs of regulating and inspecting hunt clubs with non-native swine.
- Making it only a misdemeanor for violators who release this invasive species.

In other words, the Legislature's proposal will effectively make it easier and more lucrative for hunt clubs to import an invasive species into Michigan that endangers our entire agriculture industry.

In addition to causing widespread damage to crops estimated at millions of dollars every year, feral swine also carry and transmit devastating diseases.

Pseudorabies, for example, significantly endangers Michigan's 2,100 pork producers, who market more than 2 million hogs per year. Bovine tuberculosis endangers Michigan's vibrant dairy industry — Michigan's largest agricultural commodity. Both industries have a major presence in West and Southwest Michigan. Combined, they employ more than 32,000 people across the state and pump nearly \$7 billion into the economy.

The Legislature can't put an invasive species ahead of thousands of family businesses and tens of thousands of local jobs.

The Legislature must end this absurdity, reject these proposals and let the state order stand so we can stop the feral swine epidemic in its tracks. Our future depends on it.

Dennis De Young is the owner of De Young Hog Farm in Plainwell and is president of the Michigan Pork Producers Association.

EDITORIAL: Containment won't work; ban feral swine

May 9, 2011

Michigan is lucky to know enough about destructive feral swine to ban them now, when there's still a chance to keep them from outrunning efforts to contain them.

Game-ranch operators may argue that proper fencing will keep wild boars and other related species under control. But the experience of other states says otherwise, and Michigan lawmakers should let a December order from Rebecca Humphries stand.

Humphries, then director of the former state Department of Natural Resources and Environment, declared feral swine and wild boar to be invasive species. That means, as of July 8, possessing any variety of them would be illegal in Michigan.

Her timing gave the Legislature seven months to do something different, such as impose stiff rules on the game ranches that want to continue offering wild boar hunts. But Humphries made it clear that even very stringent regulation might not work. Plus, proper oversight costs money — money the state doesn't have and money that game ranchers resist paying through appropriate licensing costs or other fees.

States with big numbers of feral swine spend a lot of money to hunt them down, generally with no hope of eradicating them but simply trying to avert the worst damage. The swine will eat almost anything, and thus threaten virtually every kind of crop in Michigan. They also can carry a number of diseases that, if transmitted to domestic pigs, dairy cows or cattle, could shut down those industries. They can disturb habitat and compete for food with many of the native game species that Michiganders enjoy hunting, from deer to ruffed grouse.

Representatives of agricultural groups have been the most outspoken in seeking to let the ban take effect, and Michigan's farming areas surely have the biggest stake. But with an estimated 2,000 feral swine already loose in the state, there have already been sightings in three-quarters of Michigan's counties, including eight in Oakland County over the last seven years. Legislation to regulate wild boar and other types of feral swine on game ranches is pending in both the state House and Senate. But this is a case where no regulation is the best choice — because Michigan should get out of the feral swine business entirely.

This editorial is reprinted from the Detroit Free Press, where it first appeared.

May 15, 2011

Michigan needs to ban feral hogs now

Bill Taylor

Many Michiganders have watched the devastating feral hog problems in other states on reality television without realizing that we have a ticking pig bomb of our own. This situation is being debated in the Michigan House of Representatives now, and Calhoun County's state legislators will play a big part in determining whether our bomb explodes or gets defused.

The culprits are non-native hogs called Russian or Eurasian boars that escaped from game ranches or are the offspring of escapees. These feral hogs eat virtually every type of crop and are causing an estimated \$1.6 billion worth of crop damage a year nationwide. They also carry diseases like pseudorabies and bovine tuberculosis that are a dire threat to Michigan's 2,100 pork producers and other livestock operations.

On the environmental side, feral hogs are extremely efficient at sniffing out and killing fawns, ground nesting birds and other native wildlife and rooting up trees to chew their roots.

These hogs are much wilder than common domesticated ones, and are extremely adept at escaping from game ranches that sell wild boar hunts and then proliferating in the wild. These escapes have been instrumental in their rapid spread across the country, and most of Michigan's several thousand wild feral hogs live in the vicinity of active or closed game ranches.

Populations like these can balloon so rapidly that the Michigan Department of Natural Resources issued an invasive species order that makes it illegal to possess feral swine in Michigan after July 8, 2011. They did this last December, and the resulting seven-month grace period gave Michigan game ranches time to liquidate their hogs and concentrate on the deer, elk and other animals that most of them also market.

However, rocker Ted Nugent and some other game ranch operators are using this time to lobby for legislation that would replace the ban with fencing requirements that experience and hog experts say will not work.

As a result, the Michigan Wildlife Conservancy, several other major environmental groups and virtually every agricultural commodity group in the state are asking the Michigan Legislature to decline to pass legislation. This would allow the feral swine ban order to take effect on July 8 and give Michigan an opportunity to eradicate its existing feral hogs without a stream of new escapes.

I live in Calhoun County, and our residents also need to understand the key roles that their state representatives are playing on different sides of this issue.

Sixty-second District State Rep. Kate Segal of Battle Creek is supporting the ban order in the House Agriculture Committee and helping muster additional support through her Democrat floor leader responsibilities. Conversely, Sixty-third District State Rep. Jase Bolger of Marshall is being counted with the representatives who want to replace the ban order with fencing requirements that would not completely stop escapes.

The legislative votes look very close, and farmers and other concerned people can help prevent a devastating situation by requesting their state legislators to keep the feral hog ban in place.

Rep. Bolger's constituents are particularly important because of his House speaker position and anti-ban leanings. And it will be very hard for any legislator to defend putting Michigan's \$71 billion agriculture industry and invaluable natural resources at risk to avoid banning one escape-artist species from a few dozen game ranches.

Bill Taylor of Calhoun County is president of the Michigan Wildlife Conservancy.

THE OAKLAND PRESS

Michigan Pork Producers Urge Legislature to Support Feral Swine Order

Tuesday, March 22, 2011

LANSING – The Michigan Pork Producers Association today called on the Legislature to let stand a state order declaring feral swine an invasive species – an essential step in banning the destructive and dangerous invaders. The MPPA also called on the Legislature to reject any attempt to weaken the order by passing so-called “regulations,” which do not work against invasive species, whether feral swine or Asian carp.

“Feral swine endangers Michigan’s pork industry and the thousands of people who depend on it for their livelihoods. Michigan must crack down hard on feral swine. Michigan’s 2,100 pork producers are vital contributors to the economy and significant employers in local communities across the state. Michigan must put our local, homegrown pork sector, which employs thousands of people, ahead of imported, non-native animals that only put our agriculture economy in danger,” MPPA Executive Vice President Sam Hines said.

Imported animals such as Russian and Eurasian boars and razorbacks have escaped from sport shooting facilities, contributing to the explosion of Michigan’s feral swine population. Feral swine are vectors for transmitting diseases and are notoriously destructive to private property, farms and crops. Wild hogs have been killed or identified in 69 of Michigan’s 83 counties and experts estimate up to 5,000 wild hogs may now inhabit Michigan.

The pork industry is a major contributor to Michigan’s agricultural economy, generating more than \$250 million annually in sales and supporting more than \$500 million of gross state product in activities created by the industry. Michigan’s 2,100 pork producers market over 2 million hogs per year and, according to an Iowa State University Study, create 5,300 pork-related jobs for the state, many of them the result of pork exports. About 25 percent of the hogs raised in Michigan and the United States are currently being exported in the form of fresh and processed pork products. According to the ISU economic impact study, an additional 700 jobs and \$30 million of personal income are generated for Michigan alone from exports of Michigan-grown pork.

According to an independent House Fiscal Agency analysis, regulatory monitoring of deer and elk hunting facilities in Michigan cost more than \$1.3 million in 2009, while fees for such facilities only generated \$106,640. The HFA analysis links cervid operations with the importation of non-native animals such as Russian boars, razorbacks, Eurasian boars and others into Michigan hunt clubs, spawning the feral swine epidemic in Michigan. The analysis also says taxpayers pay for the destruction of diseased captive animals. In 2008, so-called “game swine” were forced to be destroyed at five ranches in Michigan after the discovery of pseudorabies infections, at a cost of \$415,000 to Michigan taxpayers, according to a House Fiscal Agency document dated June 25, 2008.

<http://theoaklandpress.com/articles/2011/03/22/news/state/doc4d893db3c42d8527306514.txt>

“In few instances are we presented with the opportunity to recognize a threat to our natural resources and have the legal mechanisms aligned in such a way so as to provide true opportunities to prevent a crisis. With respect to invasive swine, the scientific community, and all available evidence is unequivocal.

Michigan law requires that to be included on the list of prohibited or restricted species, a species must pose a threat to human health, or natural, agricultural, or silviculture resources, and that an effective management technique does not exist. In the case of feral swine, the species meets each of these criteria, when meeting only one would be necessary for listing.”*

*This statement is taken from the MDNR Invasive Species Amendment Order 2010-1 which declares wild hogs an invasive species effective July 8, 2011.

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Contact: Bridget Patrick 517-241-2669

Agency: Agriculture

Pseudorabies Identified in Swine on a Michigan Game Ranch: Michigan State Ag Dept. takes action to protect swine industry

May 6, 2008

LANSING – The Michigan Department of Agriculture's (MDA) Geagley Laboratory today confirmed pseudorabies virus (PRV) infection in 19 sport swine on a privately owned cervid facility in Saginaw County. Pseudorabies is a highly contagious viral disease of swine that causes newborn piglets to die. Rarely, the disease can cause sudden death in cats and dogs and can affect cattle, sheep, and deer. The virus does not cause illness in humans and is not related to rabies.

"We must protect Michigan's \$230 million swine industry," said Don Koivisto, MDA Director. "Michigan achieved PRV-free status in 2000, and the ability of this disease to be spread by feral hogs to other animals could be a risk to the swine industry."

All swine on the Saginaw County cervid facility will be captured and destroyed. Feral swine in the vicinity of the facility are being trapped and euthanized by the United States Department of Agriculture's (USDA) Wildlife Services for disease testing. MDA encourages Michigan residents to shoot feral swine and to have MDA test the carcass for disease.

"We are contacting other states to notify them of the disease and anticipate some out-of-state markets will impose restrictions on live swine from Michigan until testing proves that this is an isolated case," said MDA State Veterinarian Steven Halstead. "We need to confirm as quickly as possible that the disease has not spread to other farms."

Effective immediately, MDA is banning the importation of swine intended for: breeding on game ranches, for supply to game ranches, or facilities using swine for sport, hunting, or shooting. Any farms that sold to, or received live swine from this facility will be quarantined and tested. Violations of the quarantine and ban are punishable by fines of up to \$50,000 and/or up to five years imprisonment. Additionally, all farms and ranches with commercial or sport swine in a five-mile radius around the PRV positive ranch will be quarantined and the swine tested for PRV.

Michigan's PRV-free status for the commercial swine industry should remain intact as long as commercial operations remain PRV-free.

Because of concerns regarding transmitting PRV to pigs through the feeding of garbage containing meat, Michigan prohibited garbage feeding several years ago. Meat from PRV positive swine is safe for humans to consume; however, MDA recommends cooking meat to 165 degrees F as a general precaution against foodborne illness.

PRV is transmitted through nasal and oral secretions, food, water, and the environment, and can be carried on car tires, boots, and clothing. Additionally, swine may harbor the virus without showing clear signs.

For more information, please visit the MDA Web site at www.michigan.gov/mda or the United States Department of Agriculture Web site at www.usda.gov.

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the experimental procedures and the statistical analysis performed.

3. The third part of the document presents the results of the study. It includes a series of tables and graphs that illustrate the findings of the research. The data shows a clear trend of increasing activity over time.

4. The fourth part of the document discusses the implications of the findings. It suggests that the results have significant implications for the field of study and may lead to further research in this area.

5. The fifth part of the document provides a conclusion and summarizes the key points of the study. It reiterates the importance of accurate record-keeping and the need for ongoing research in this field.

6. The sixth part of the document includes a list of references and a bibliography. It cites various sources that have been consulted during the research process, including books, articles, and online resources.

7. The seventh part of the document contains a list of appendices. These include additional data, figures, and tables that are not included in the main body of the document but are available for reference.

8. The eighth part of the document is a list of footnotes. These provide additional information and clarification for the main text, including details about the research methodology and the sources of the data.

9. The ninth part of the document is a list of acknowledgments. It expresses gratitude to the individuals and organizations that have provided support and assistance during the research process.

10. The tenth part of the document is a list of references. It includes a comprehensive list of all the sources cited in the document, organized alphabetically by author.

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